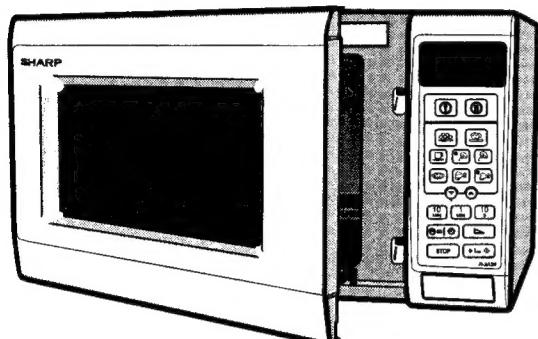


SHARP® SERVICE MANUAL



R-3A56

MICROWAVE OVEN

MODELS

R-3A56(W)
R-3A56(B)

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

**CAUTION
MICROWAVE RADIATION**

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached.

Never look into an open waveguide or antenna while the device is energised.

**VARNING
MIKROVAGGSSTRALING**

Personal får inte utsättas för mikrovågsenergi som kan utstrala från magnetronen eller andre mikrovågsalstrande anordningar om dessa är felanslutna eller används på fel sätt. Alla in-och utgångsanslutningar för mikrovågor, vågledare, flänsar och packningar måste vara fast anslutna. Mikrovågsgeneratorn får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i en öppen vågledare eller antenn när mikrovågsgeneratorn är påkopplad eller laddad.

**VAROITUS
MIKROAALTOSATEILYA**

Käyttäjä ei saa joutua alittiaksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään väärin tai jos se kytketään väärin. Kaikkien mikroaaltoiitiantöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.

Mikroaaltonaria ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu. Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

**ADVARSEL
MIKRØBOLGESTRÅLING**

Personell må ikke utsettes for mikrobølge-energi som kan utstråles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet. Alle inn-og uttilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.

Aldri bruk apparatet med mindre en mikrobølge-absorberende last er plassert i ovnsrommet. Aldri se direkte inn i en åpen bølgeleder eller antennen imens apparatet er strømførende.

**ADVARSEL
MIKRØBOLGEBESTRALING**

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og -udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.

Anvend aldrig ovnen uden en mikrobølgeabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antennen, mens ovnen er i brug.

SERVICE MANUAL

SHARP

MICROWAVE OVEN

R-3A56(W) / R-3A56(B)

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service Engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

Note: The parts marked "*" are used at voltage more than 250V. (Parts List)

Anm: Delar märket med "*" har en spänning överstigande 250V.

Huom: Huolto-ohjeeseen merkityt. "tähdella" osat joissa jännite on yli 250V.

Bemerk: Dele som er merket "asterisk" er utsatt for spenninger over 250V til jord.

Bemærk: Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained Service Engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

PRODUCT SPECIFICATION

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

SERVICING AND TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT TEST DATA AT A GLANCE

WIRING DIAGRAM

PARTS LIST

PRODUCT SPECIFICATIONS

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	220 -230 Volts 50 Hertz Single phase, 3 wire grounded
Power Consumption	1.5 kW
Power Output	900W watts nominal of RF microwave energy (measured by way of IEC 705) Operating frequency of 2450 MHz
Case Dimensions	Width 450mm Height 295mm including foot Depth 360mm
Cooking Cavity Dimensions	Width 290mm Height 174mm Depth 313mm
Turntable diameter	272mm
Control Complement	Touch Control System Clock(1:00-12:59 or 0:00-23:59) Microwave Power for Variable Cooking Repetition Rate; HIGH..... Full power throughout the cooking time MEDIUM HIGH approx. 70% of Full Power MEDIUM approx. 50% of Full Power MEDIUM LOW approx. 30% of Full Power LOW approx. 10% of Full Power AUTO MINUTE pad START pad POWER LEVEL pad STOP/CLEAR pad Time pads
Set Weight	Approx. 14.6 kg

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

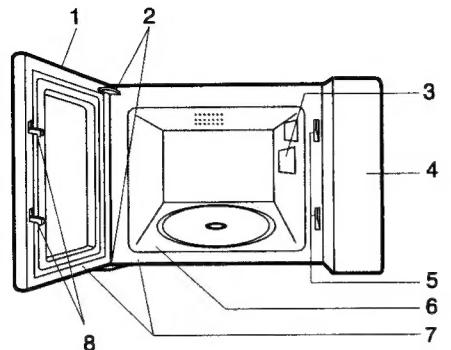
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

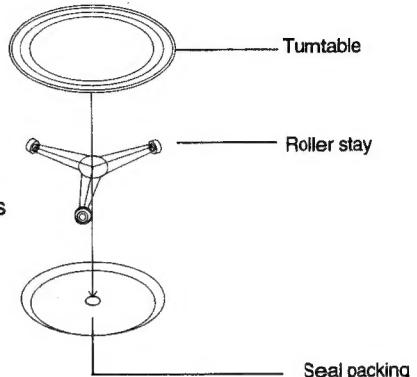
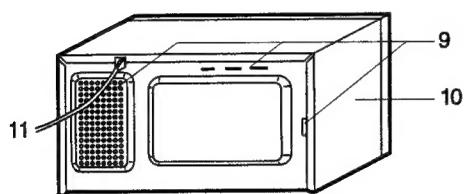
GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

APPEARANCE VIEW

OVEN

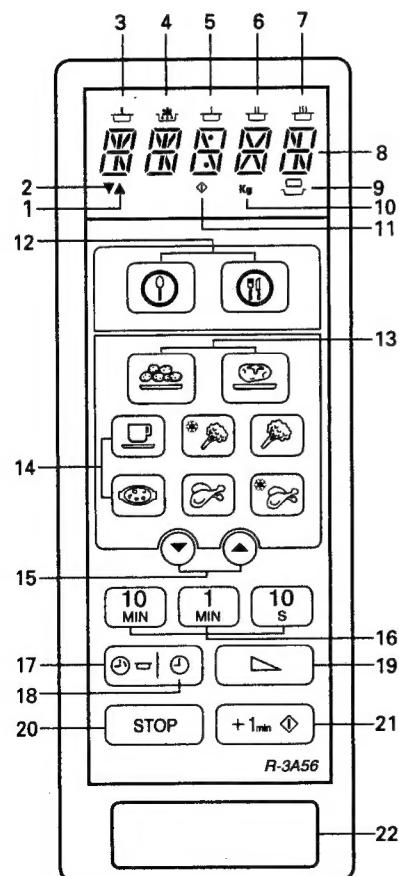


1. Door
2. Door hinges
3. Waveguide cover
4. Control panel
5. Door lock openings
6. Oven cavity
7. Door seals and sealing surfaces
8. Safety door latches
9. Ventilation openings
10. Outer case
11. Power supply cord



1. Place the roller stay on the floor of the oven cavity.
2. Then place the turntable on it fitting to the coupling.

THE AUTO-TOUCH CONTROL PANEL



1. More Indicator
2. Less Indicator
3. Low Indicator
4. Med/Low indicator
5. Med indicator
6. Med/High indicator
7. High indicator
8. Digital display
9. Pieces indicator
10. Unit weight indicator
11. Cook indicator
12. Snack keys
13. Potato keys
14. Instant action keys
15. More/Less keys
16. Time keys
17. Timer/Hold key
18. Clock set key
19. Power level key
20. Stop key
21. Auto minute/Start key
22. Door open button

OPERATING SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (primary latch switch, 2nd latch switch and stop switch).

IMPORTANT

When the oven door is closed, the monitor switch contacts COM - NC must be open.

When the microwave oven is plugged in a wall outlet (240V 50Hz), the line voltage is supplied to the point A3+A5 in the control unit.

Figure O-1 on page 30

1. The display flashes "88:88".
2. To set any programmes or set the clock, you must first touch the STOP pad.
3. "88:88" appears in the display and the time counts up every minute.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching Time pad and start the oven with touching START pad.

Function sequence Figure O-2 on page 30

CONNECTED COMPONENTS	RELAY
Oven lamp, Fan motor, Turntable motor	RY1
Power transformer	RY2

1. The line voltage is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channeled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a single tone is heard and the relays RY1 + RY2 go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off.

5. When the door is opened during a cook cycle, the switches come to the following condition.

SWITCH	CONTACT	CONDITION	
		DURING COOKING	DOOR OPEN (NO COOKING)
Primary latch switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed
2nd latch switch	COM-NO	Closed	Open
Stop switch	COM-NO	Closed	Open

The circuits to the power transformer, fan motor and turntable motor are cut off when the primary latch switch, 2nd latch switch and stop switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is the remaining time.

6. MONITOR SWITCH CIRCUIT

The monitor switch (SW3) is mechanically controlled by oven door, and monitors the operation of the 1st latch switch (SW1)

- 6-1 When the oven door is opened during or after the cycle of cooking program, the primary latch switch (SW1), and stop switch (SW4) must open their contacts first. After that the contacts (COM - NC) of the monitor switch (SW3) can be closed and then contacts of the 2nd latch switch (SW2) can be opened.
- 6-2 When the oven door is closed, the contacts (COM - NC) of the monitor switch (SW3) must be opened and contacts (COM - NO) of the 2nd latch switch (SW2) must be closed first. After that the contacts of the primary latch switch (SW1) and stop switch (SW4) are closed.
- 6-3 When the oven door is opened and the contacts of the primary latch switch (SW1) remain closed, the fuse (F) F7.4A will blow, because the monitor switch is closed and a short circuit is caused.

HIGH, MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the power transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay (RY2). The following levels of microwave power are given.

SETTING	32 sec. ON		
HIGH	32 sec. ON	8 sec. OFF	
MEDIUM HIGH	24 sec. ON	8 sec. OFF	Approx. 70% = 630 Watts
MEDIUM	18 sec. ON	14 sec. OFF	Approx. 50% = 450 Watts
MEDIUM LOW	12 sec. ON	20 sec. OFF	Approx. 30% = 270 Watts
LOW	6 sec. ON	30 sec. OFF	Approx. 10% = 90 Watts

NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the door open button on the control panel. When the door open button is pushed, the cook lever is moved upward, operating the latch head. The latch head is moved upward, and released from the latch hook. Now, the door can be opened.

DOOR

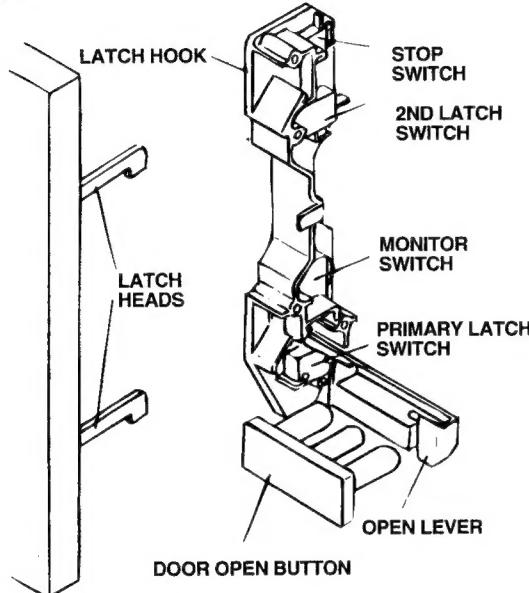


Figure D-1. Door Open Mechanism

PRIMARY LATCH SWITCH (SW1)

2ND LATCH SWITCH (SW2)

STOP SWITCH (SW4)

1. When the oven door is closed, the contacts (COM - NO) must be closed.
2. When the oven door is opened, the contacts (COM - NO) must be opened.

MONITOR SWITCH (SW3)

1. When the oven door is closed, the contacts (COM - NC) must be opened.
2. When the oven door is opened, the contacts (COM - NC) must be closed.
3. If the oven door is opened and the contacts (COM - NO) of the primary latch switch (SW1) fail to open, the fuse F7.4A blows simultaneously with closing the contacts (COM - NC) of the monitor switch (SW3).

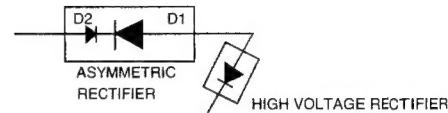
CAUTION: BEFORE REPLACING A BLOWN FUSE (F)
F7.4A TEST THE PRIMARY LATCH SWITCH (SW1), MONITOR SWITCH (SW3) AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE".)

MONITOR RESISTOR 0.8ohm 20W

The monitor resistor prevents the maximum breaking capacity of the F7.4A fuse from being exceeded due to operation of the monitor switch

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the special fuse F7.4A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the fuse F7.4A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the power transformer.
5. The large electric currents flow through the primary winding of the power transformer.
6. The fuse F7.4A blows by the large electric currents.
7. The power supply to the power transformer is cut off.

FUSE F7.4A

1. The fuse F7.4A blows when the contacts (COM - NO) of the primary latch switch (SW1) remain closed with the oven door open and when the monitor switch (SW3) closes.
2. The fuse F7.4A also blows when asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.
3. If the wire harness or electrical components are short-circuited, the fuse F7.4A blows to prevent an electric shock or fire hazard.

THERMAL CUT-OUT 145°C TC1 (MG)

The thermal cut-out protects the magnetron against overheat. If this temperature goes up higher than 145°C because the fan motor is interrupted, the ventilation openings are blocked, the thermal cut-out (TC1) will open and line voltages to the power transformer will be cut off and the operation of the magnetron will be stopped. The defective thermal cut-out (TC1) must be replaced with new one.

THERMAL CUT-OUT 125°C TC2 (OVEN)

The thermal cut-out located on the top of the oven cavity is designed to prevent damage to the oven if the foods in the oven catch fire due to over heating produced by unproper setting of cook time or failure of control unit. Under normal operation, the oven thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the oven thermal cut-out will open at 125°C, causing the oven to shut down. The defective thermal cut-out (TC2) must be replaced with new one.

TURNTABLE MOTOR

The turntable motor drives the turntable roller assembly to rotate the turntable.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts:
High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the microwave timer for two (2) minutes. Set the power level to HIGH and push the START button. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F7.4A in the primary latch switch - monitor switch - monitor resistor circuit, check the primary latch switch, monitor switch and monitor resistor before replacing the fuse F7.4A.

TEST PROCEDURE		A	B	C	D	E	E	E	F	G	H	I	J	J	
CONDITION	PROBLEM	MAGNETRON	POWER TRANSFORMER	HV RECTIFIER ASSEMBLY	HV CAPACITOR	PRIMARY CAPACITOR	2ND LATCH	MONITOR LATCH	STOP SWITCH	TERMAL CUT OUT	FUSE F7.4A	NOISE FILTER	MONITOR RESISTOR	FAN MOTOR	TURNTABLE MOTOR
OFF CONDITION	Home fuse blows when power cord is plugged into wall outlet.														
	Fuse F7.4A blows when power cord is plugged into wall outlet.										○			○	
	"88:88" dose not appear in display when power cord is plugged into wall outlet.											○	○	○	
	Display does not operate properly when STOP/CLEAR pad is touched.										○				
	Oven lamp does not light when door is opened. (Display appears.)										○				
COOKING CONDITION	Oven does not start when START pad is touched. (Display appears.)										○				
	Oven lamp does not light. (Display appears.)														
	Fan motor does not operate. (Display appears.)												○	○	
	Turntable motor assembly does not operate. (Display appears.)												○	○	
	Oven or electrical parts do not stop when cooking time is 0 or STOP pad is touched.														
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at "HIGH")	○	○			○	○								
	Oven does not operate properly during the variable cooking condition except "HIGH" cooking condition. (Oven stops when STOP pad is touched.)														
	Oven goes into cook cycle but shuts down before end of cooking cycle.											○	○		
	Oven stops as soon as the START pad is touched.					○						○			

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	<p>MAGNETRON TEST</p> <p>NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.</p> <p>CARRY OUT 3D CHECK</p> <p>Isolate the magnetron from high voltage circuit by removing all leads connected to the filament terminal.</p> <p>To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.</p> <p>To test for a short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.</p> <p>MICROWAVE OUTPUT POWER (IEC-705-1988)</p> <p>The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When $P(W)$ heating works for $t(\text{second})$, approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with $V(\text{ml})$ rises $\Delta T (\text{ }^{\circ}\text{C})$ during this microwave heating period, the calorie of the water is $V \times \Delta T$.</p> <p>The formula is as follows; $P \times t / 4.187 = V \times \Delta T \quad P (W) = 4.187 \times V \times \Delta T / t$</p> <p>Our condition for water load is as follows: Room temperature.....around 20°C Power supply Voltage.....Rated voltage Water load.....1000 g Initial temperature.....10 ± 2°C Heating time.....47 sec. $P = 89 \times \Delta T$</p>

Measuring condition:

1. Container
The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
The oven and the empty vessel are at ambient temperature prior to the start of the test.
3. Temperature of the water
The initial temperature of the water is (10 ± 2) °C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and an accurate thermometer.
7. The water load must be (1000 ± 5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 3" sec. 3 sec. is magnetron filament heat-up time.

Measuring method:

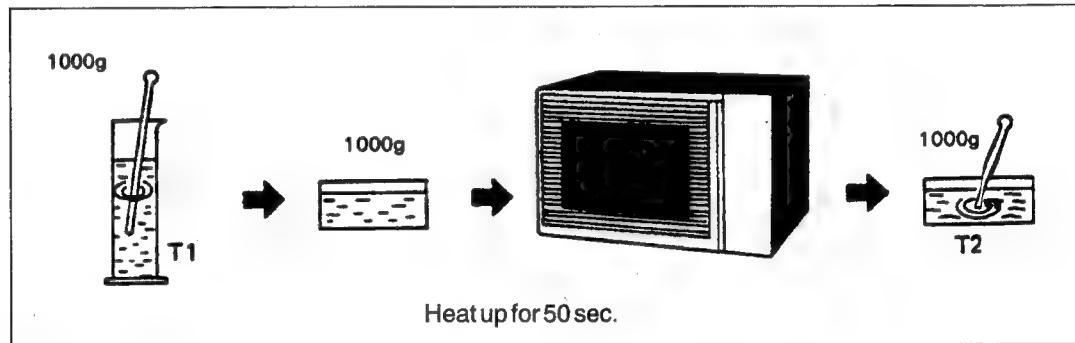
1. Measure the initial temperature of the water before the water is added to the vessel.
(Example: The initial temperature $T_1 = 11^{\circ}\text{C}$)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST										
	<p>6. Measure the final water temperature. (Example: The final temperature $T_2 = 21^\circ\text{C}$) 7. Calculate the microwave power output P in watts from above formula.</p> <table border="1"> <tr> <td>Initial temperature</td> <td>$T_1 = 11^\circ\text{C}$</td> </tr> <tr> <td>Temperature after $(47 + 3) = 50$ sec.</td> <td>$T_2 = 21^\circ\text{C}$</td> </tr> <tr> <td>Temperature difference Cold-Warm</td> <td>$\Delta T_1 = 10^\circ\text{C}$</td> </tr> <tr> <td>Measured output power</td> <td></td> </tr> <tr> <td>The equation is "$P = 89 \times \Delta T$"</td> <td>$P = 89 \times 10^\circ\text{C} = 890$ Watts</td> </tr> </table>	Initial temperature	$T_1 = 11^\circ\text{C}$	Temperature after $(47 + 3) = 50$ sec.	$T_2 = 21^\circ\text{C}$	Temperature difference Cold-Warm	$\Delta T_1 = 10^\circ\text{C}$	Measured output power		The equation is " $P = 89 \times \Delta T$ "	$P = 89 \times 10^\circ\text{C} = 890$ Watts
Initial temperature	$T_1 = 11^\circ\text{C}$										
Temperature after $(47 + 3) = 50$ sec.	$T_2 = 21^\circ\text{C}$										
Temperature difference Cold-Warm	$\Delta T_1 = 10^\circ\text{C}$										
Measured output power											
The equation is " $P = 89 \times \Delta T$ "	$P = 89 \times 10^\circ\text{C} = 890$ Watts										

JUDGEMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 89 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B POWER TRANSFORMER TEST

WARNING: High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

- a. Primary winding 1.4 ohms approximately
- b. Secondary winding 93 ohms approximately
- c. Filament winding less than 1 ohm

If the reading obtained are not stated as above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

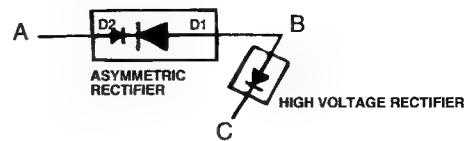
HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B + C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST									
	<p>CARRY OUT <u>4R</u> CHECKS</p>									
	<p><u>ASYMMETRIC RECTIFIER TEST</u></p>									
	<p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminals A + B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with the high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.</p>									
	<p>CARRY OUT <u>4R</u> CHECKS</p> <p>NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.</p>									
D	<p><u>HIGH VOLTAGE CAPACITOR TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS</p> <p>A. Isolate the high voltage capacitor from the circuit. B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range. C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about $10\text{ M}\Omega$ after it has been charged. D. A short-circuited capacitor shows continuity all the time. E. An open capacitor constantly shows a resistance about $10\text{ M}\Omega$ because of its internal $10\text{ M}\Omega$ resistance. F. When the internal wire is opened in the high voltage capacitor, the capacitor shows an infinite resistance. G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal. If incorrect reading are obtained, the high voltage capacitor must be replaced.</p>									
	<p>CARRY OUT <u>4R</u> CHECKS</p>									
E	<p><u>SWITCH TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS</p> <p>Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.</p> <p>Table: Terminal Connection of Switch</p> <table border="1"><thead><tr><th>Plunger Operation</th><th>COM to NO</th><th>COM to NC</th></tr></thead><tbody><tr><td>Released</td><td>Open circuit</td><td>Short circuit</td></tr><tr><td>Depressed</td><td>Short circuit</td><td>Open Circuit</td></tr></tbody></table> <p>COM; Common terminal NO; Normally open terminal NC; Normally close terminal</p> <p>If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Plunger Operation	COM to NO	COM to NC	Released	Open circuit	Short circuit	Depressed	Short circuit	Open Circuit
Plunger Operation	COM to NO	COM to NC								
Released	Open circuit	Short circuit								
Depressed	Short circuit	Open Circuit								



TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
F	<p><u>THERMAL CUT-OUT TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS</p> <p>Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.</p> <p>CARRY OUT <u>4R</u> CHECKS</p> <p>Temperature of "ON" condition (closed circuit) This is not resetable type Temperature of "OFF" condition (open circuit) Above 125/145°C Indication of ohmmeter (When room temperature is approx. 20°C.) Closed circuit</p> <p>If incorrect readings are obtained replace the oven 145°C thermal cut-out.</p> <p>An open circuit thermal cut-out (MG) indicates that magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.</p> <p>An open circuit thermal cut-out (OVEN) indicates that the foods in the oven may catch fire, this may be due to over heating produced by unproper setting of the cooking timer or failure of the control panel.</p>
G	<p><u>BLOWN FUSE F7.4A</u></p> <p>CARRY OUT <u>3D</u> CHECKS</p> <ol style="list-style-type: none">1. If the fuse F7.4A is blown, there could be shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.2. If the F7.4A is blown, there could be a short in the asymmetric rectifier or there could be a ground in wire harness. A short in the asymmetric rectifier may have occured due to short or ground in H.V. rectifier, magnetron, power transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.3. If the fuse F7.4A is blown when the door is opened, check the primary latch switch, monitor switch and monitor resistor. If the fuse F7.4A is blown by incorrect door switch replace the defective switch (s) and the fuse F7.4A. <p>CARRY OUT <u>4R</u> CHECKS</p> <p>CAUTION: Only replace special fuse F7.4A with the correct value replacement.</p>

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST								
H	NOISE FILTER TEST CARRY OUT 3D CHECKS Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.								
	<table border="1"> <thead> <tr> <th>L(min)</th> <th>Cx ± 20%</th> <th>Cy ± 20%</th> </tr> </thead> <tbody> <tr> <td>1.0mH</td> <td>0.068µF</td> <td>0.0033µF</td> </tr> </tbody> </table>	L(min)	Cx ± 20%	Cy ± 20%	1.0mH	0.068µF	0.0033µF		
L(min)	Cx ± 20%	Cy ± 20%							
1.0mH	0.068µF	0.0033µF							
	<table border="1"> <thead> <tr> <th>MEASURING POINTS</th> <th>INDICATION OF OHMMETER</th> </tr> </thead> <tbody> <tr> <td>Between N and L</td> <td>Open circuit</td> </tr> <tr> <td>Between terminal N and WHITE</td> <td>Short circuit</td> </tr> <tr> <td>Between terminal L and RED</td> <td>Short circuit</td> </tr> </tbody> </table> <p>If incorrect readings are obtained, replace the noise filter unit.</p>	MEASURING POINTS	INDICATION OF OHMMETER	Between N and L	Open circuit	Between terminal N and WHITE	Short circuit	Between terminal L and RED	Short circuit
MEASURING POINTS	INDICATION OF OHMMETER								
Between N and L	Open circuit								
Between terminal N and WHITE	Short circuit								
Between terminal L and RED	Short circuit								
I	CARRY OUT 4R CHECKS MONITOR RESISTOR TEST CARRY OUT 3D CHECKS Disconnect the leads from the monitor resistor. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor as described in the following table.								
	<p style="text-align: center;">Table: Resistance</p> <table border="1"> <thead> <tr> <th>Resistor</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>Monitor resistor</td> <td>Approx. 4.3Ω</td> </tr> </tbody> </table> <p>If incorrect readings are obtained, replace the monitor resistor or surge resistor</p>	Resistor	Resistance	Monitor resistor	Approx. 4.3Ω				
Resistor	Resistance								
Monitor resistor	Approx. 4.3Ω								
J	MOTOR WINDING TEST CARRY OUT 3D CHECKS Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.								
	<p style="text-align: center;">Table: Resistance of Motor</p> <table border="1"> <thead> <tr> <th>Motors</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>Fan motor</td> <td>Approximately 360Ω</td> </tr> <tr> <td>Turntable motor</td> <td>Approximately 12kΩ</td> </tr> </tbody> </table> <p>If incorrect readings are obtained, replace the motor. (Also refer to test procedure K)</p>	Motors	Resistance	Fan motor	Approximately 360Ω	Turntable motor	Approximately 12kΩ		
Motors	Resistance								
Fan motor	Approximately 360Ω								
Turntable motor	Approximately 12kΩ								
	CARRY OUT 4R CHECKS								

TEST PROCEDURES (CONT'D)

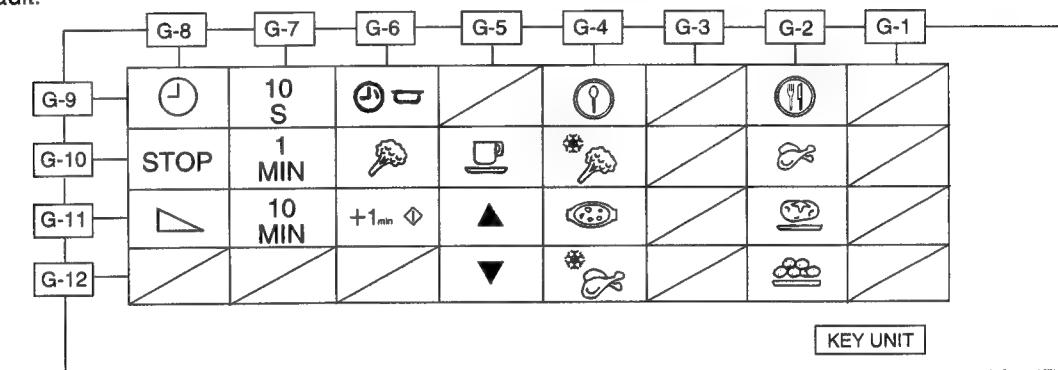
PROCEDURE LETTER	COMPONENT TEST
K	<p>LIVE TEST FOR MOTOR WINDINGS</p> <p>CAUTION: The following procedure requires the oven to be connected to the supply and should only be used if the relevant "cold" checks for the motor under test are inconclusive.</p> <ol style="list-style-type: none"> 1. CARRY OUT <u>3D</u> CHECKS 2. Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis. (Use insulation tape if necessary.) 3. Connect a voltmeter, set to 250V AC, across the motor terminals. (Refer to the relevant motor test procedure or pictorial diagram for the correct terminal numbers.) 4. Arrange the meter in a position where it can be read during the test. (Do not touch the meter, meter leads or oven circuitry while the oven is active.) 5. Close the oven door. 6. Set the power level to HIGH and set the relevant timer for about three (3) minutes. 7. Note the reading on the meter and carefully observe the motor under test to see if it is turning. 8. CARRY OUT <u>3D</u> CHECKS 9. Remove test meter leads. 10. Reconnect the leads to the primary of the power transformer. <p>If a reading of the line voltage was obtained (step 7) but the motor was not turning then it is faulty and should be replaced. If the meter indicated that no supply was present then the wiring to the motor should be checked for continuity.</p>
L	<p>TOUCH CONTROL PANEL ASSEMBLY TEST</p> <p>The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.</p> <p>In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and troubleshooting by replacement is described according to the symptoms indicated.</p> <ol style="list-style-type: none"> 1. Key Unit. Note: Check key unit ribbon connection before replacement. The following symptoms indicate a defective key unit. Replace the key unit. <ol style="list-style-type: none"> a) When touching the pads, a certain pad produces no signal at all. b) When touching a number pad, two figures or more are displayed. c) When touching the pads, sometimes a pad produces no signal. 2. Control Panel The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test(Procedure M) to determine if control unit is faulty. <ol style="list-style-type: none"> a) When touching the pads, a certain group of pads do not produce a signal. b) When touching the pads, no pads produce a signal. 2-1 In connection with pads. <ol style="list-style-type: none"> a) At a certain digit, all or some segments do not light up. b) At a certain digit, brightness is low. c) Only one indicator does not light. d) The corresponding segments of all digits do not light up; or they continue to light up. e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. 2-2 Other possible problems caused by defective control unit. <ol style="list-style-type: none"> a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
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KEY UNIT TEST

If the display fails to clear when the STOP pad is depressed, first verify the flat ribbon is marking good contact, verify that the door sensing switch(stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch(stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.



CARRY OUT 4R CHECKS.

M RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 3 and 5 of the 3 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 220~230 volts, if not check oven circuit.

RY1 and RY2 Relay Test

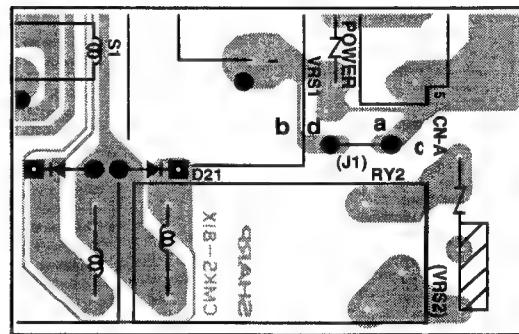
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good,

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 18.0V.D.C.	Oven lamp/Turntable motor/Cooling fan motor
RY2	Approx. 18.0V.D.C.	Power transformer

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST															
N	<p>PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD(PWB) IS OPEN</p> <p>To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.</p> <p>Problem: POWER ON, indicator does not light up.</p> <p>CARRY OUT 3D CHECKS.</p> <table border="1"> <thead> <tr> <th>STEPS</th><th>OCCURANCE</th><th>CAUSE OR CORRECTION</th></tr> </thead> <tbody> <tr> <td>1</td><td>The rated AC voltage is not present at POWER terminal of CPU connector (CN-A)</td><td>Check supply voltage and oven power cord.</td></tr> <tr> <td>2</td><td>The rated AC voltage is present at primary side of low voltage transformer.</td><td>Low voltage transformer or secondary circuit defective. Check and repair.</td></tr> <tr> <td>3</td><td>Only pattern at "a" is broken.</td><td>*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)</td></tr> <tr> <td>4</td><td>Pattern at "a" and "b" are broken.</td><td>*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)</td></tr> </tbody> </table> <p>NOTE: At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.</p> <p>CARRY OUT 4R CHECKS.</p> 	STEPS	OCCURANCE	CAUSE OR CORRECTION	1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.	2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.	3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)	4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)
STEPS	OCCURANCE	CAUSE OR CORRECTION														
1	The rated AC voltage is not present at POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.														
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.														
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)														
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)														

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Key Unit
- (2) Control Unit

The principal functions of these units and the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through R10-R13, R20 and R22. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R00-R03 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit and indicator circuit.

1) LSI

This LSI controls the key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit

This circuit generates voltages necessary in the control unit.

Symbol	Voltage	Application
VC	-5V	LSI(IC1)
VP	-32V	Fluorescent display tube : Grid and anode voltage
VF1	2.2Vac	Filament of fluorescent display tube
VF2		(VF1 to VF2 voltage)

3) Synchronizing Signal Circuit

The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL Circuit

A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit

The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completionsound).

6) Door Sensing Switch (Stop Switch)

A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit

To drive the magnetron, fan motor, turntable motor and light the oven lamp.

8) Indicator Circuit

Indicator element is a Fluorescent Display. Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode.

The Fluorescent Display has 6-digits, 13-segments are used for displaying figures.

DESCRIPTION OF LSI

LSI(IZA590DR)

The I/O signal of the LSI(IZA590DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1	Vdisp	IN	Anode (segment) of Fluorescent Display illumination voltage: -32V Vp voltage of power source circuit input.
2	R00	IN	Signal coming from touch key. When either one of G12 line keys on key matrix is touched, a corresponding signal will be input into R00.
3	R01	IN	Signal coming from touch key. When either one of G11 line keys on key matrix is touched, a corresponding signal will be input into R01.
4	R02	IN	Signal coming from touch key. When either one of G10 line keys on key matrix is touched, a corresponding signal will be input into R02.
5	R03	IN	Signal coming from touch key. When either one of G9 line keys on key matrix is touched, a corresponding signal out of R20 and R22, R10-R13 will be input into R03. When no key is touched, the signal is held at "L" level.
6	TEST	IN	Connected to VC.
7	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is set. Thereafter set at "H" level.
8	OSC1	IN	Internal clock oscillation frequency input setting. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to OSC1 terminal.
9	OSC2	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of OSC2.
10/11	GND/AVSS	IN/IN	Connected to VC.
12	AN0	OUT	Oven lamp,turntable motor and cooling fan motor driving signal. (Square Waveform : 50Hz) To turn on and off the control relay. The pulse signal (50Hz) is delivered to the control relay driving circuit and cook relay control circuit.
13	AN1	OUT	Terminal not used.
14	AN2	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay. In Low operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED,MED LOW,LOW) the signal turns to "H" level and "L" level in repetition according to the power level.
15	AN3	OUT	Terminal not used.
16	AN4	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal. Door opened; "L" level signal.
17-19	AN5-AN7	IN	Connected to VC.
20/21	AVCC/VCC	IN/IN	Connected to GND.
22	INT0	IN	Signal synchronized with commercial source frequency(50Hz). This is basic timing for time processing of LSI.
23	D1	OUT	Terminal not used.
24	D2	OUT	Digit selection signal. Refer to the touch control panel circuit about the relation between signal and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display.

Pin No.	Signal	I/O	Description
25	BUZZ	OUT	Signal to sound buzzer. A: key touch sound(0.12sec.). B: Completion sound(2.4sec.).
26	D4	OUT	Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display.
27	D5	OUT	Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display.
28	D6	OUT	Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display.
29	D7	OUT	Digit selection signal. Refer to the touch control panel circuit about the relation between signals and digits. Normally, one pulse is output in every synchronized signal period, and input to the grid of the fluorescent display.
30	D8	OUT	Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display.
31	R80	OUT	Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display.
32	R81	OUT	Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display.
33	R82	OUT	Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display.
34	R83	OUT	Segment data signal. Refer to the touch control panel circuit for the relationship between signals and indicators. Normally, one pulse is output in every synchronized signal period, and input to the anode of the fluorescent display.
35	R10	OUT	Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G8 line keys on key matrix is touched.
36	R11	OUT	Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G7 line keys on key matrix is touched.
37	R12	OUT	Segment data signal. Signal similar to D8. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G6 line keys on key matrix is touched.

Pin No.	Signal	I/O	Description
38	R13	OUT	<p><u>Segment data signal.</u> Signal similar to D8. <u>Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G5 line keys on key matrix is touched.</p>
39	R20	OUT	<p><u>Segment data signal.</u> Signal similar to D8. <u>Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G4 line keys on key matrix is touched.</p>
40	R21	OUT	<p><u>Segment data signal.</u> Signal similar to D8.</p>
41	R22	OUT	<p><u>Segment data signal.</u> Signal similar to D8. <u>Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R00-R03 terminal while one of G2 line keys on key matrix is touched.</p>
42	R23	OUT	<p><u>Segment data signal.</u> Signal similar to D8.</p>

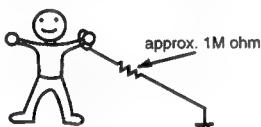
SERVICING

1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
DTA114ES
DTA143ES
DTD143ES
2SA933S



Transistor
2SB910M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel. It is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch heads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

6. Discharge the H.V. capacitor before carrying out any further work.
7. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder from the base plate.

4. Remove the capacitor from the capacitor holder.
5. Now high voltage rectifier assembly and capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
3. Disconnect HV wire from the transformer.

4. Remove 4 screws to the HVT base plate.
5. Remove the transformer.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
3. Remove the one (1) screw holding the chassis support to the magnetron, and one (1) to the noise filter unit and one (1) from cavity.

4. Move the air intake duct to left and remove chassis support.

7. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
8. Remove the magnetron from the waveguide with care so that the magnetron antenna is not hit by any metal object around the antenna.

9. Remove the magnetron cushion from the magnetron.

**CAUTION: WHEN REPLACING THE MAGNETRON,
BE SURE THE R.F. GASKET IS IN PLACE
AND THE MAGNETRON MOUNTING
SCREWS ARE TIGHTENED SECURELY.**

FAN MOTOR REMOVAL

1. Slide forward fan duct, removing fan motor wires in process, remove from oven.
2. Remove two (2) fan motor screws, two (2) nuts from fan duct and remove motor from oven.
3. Now the fan motor is free.

CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the main harness and stop switch harness from the control panel.
3. Remove the one (1) screw holding the control panel to the oven cavity.
4. Lift up the control panel assembly and pull it forward. Now, the control panel assembly is free.

TURNTABLE MOTOR REMOVAL

1. Disconnect the oven from power supply.
2. Remove the turntable motor cover by snipping of material in four corners.
3. Where the corners have been snipped off bend corner areas flat. No sharp edge must be evident after removal of TT motor cover.
4. Disconnect the wire lead from turntable motor and remove the one (1) screw holding the turntable motor.
5. Turntable is now free.
6. After replacement use the one (1) screw allocated to fit the TT motor cover.

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Unlock the terminals from the oven lamp socket and remove wires.
3. Lift up the oven lamp socket, Unclipping from air intake duct.
4. Now, the oven lamp socket is free.

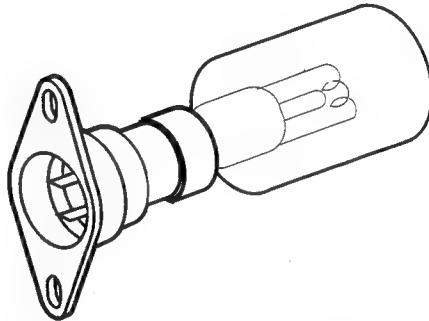


Figure C-2. Oven lamp socket

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire to the chassis support.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-3 (a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

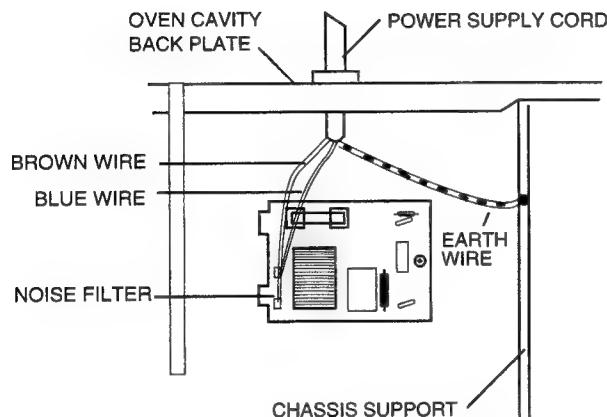


Figure C-3 (a) Replacement of Power Supply Cord

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-3 (b). Installation of Power supply cord.
2. Install the earth wire lead of power supply cord to the rear chassis support with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

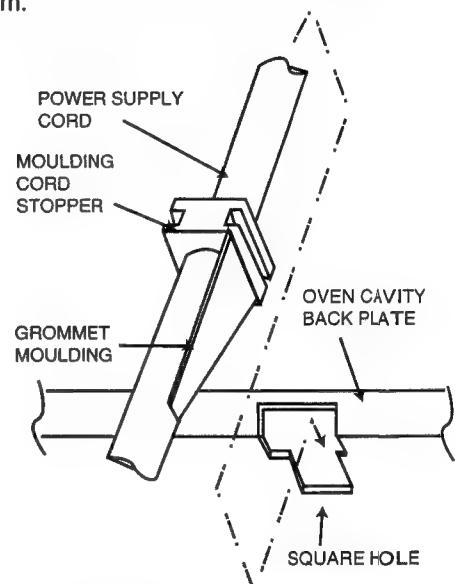


Figure C-3 (b) Replacement of Power Supply Cord

PRIMARY LATCH SWITCH, 2ND LATCH SWITCHES, STOP SWITCH AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Push the retaining tab slightly and remove the switch.

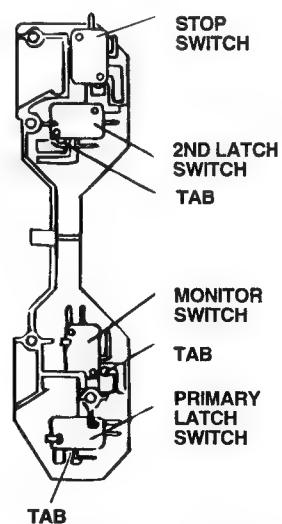


Figure C-4. Switches

PRIMARY LATCH SWITCH, 2ND LATCH SWITCHES, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the primary latch switch, 2nd. latch switch, stop switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS
2. Loosen the one (1) screw holding the latch hook to the oven cavity front flange.
3. With door closed, adjust the latch hook by moving it back and forward, or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch and 2nd latch switch have activated with the door closed.
The vertical position of the latch hook should be placed where the primary latch switch and stop switch have activated with the door closed.
4. Secure the screw with washer firmly.
5. Make sure of the primary latch switch, 2nd latch switch, stop switch and monitor switch operation. If those switches have not activated with the door closed, one (1) screw holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The results (play of the door) should be less than 0.5 mm.
2. The contacts (COM - NO) of primary latch switch and stop switch interrupt the circuit before the door can be opened.

3. The contacts (COM - NC) of the monitor switch close when the door is opened.
4. The contacts (COM - NO) of the 2nd latch switch open when the door is opened.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

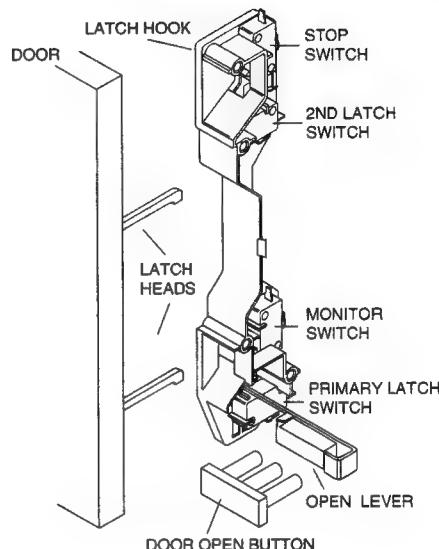


Figure C-5 Latch Switches Adjustment

DOOR FRAME AND SCREEN REMOVAL

Remove the door assembly, referring to item 1 through item 4 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".

3. Release the door frame from the door panel assembly, now the door frame is free.
4. The screen is fitted to the frame with double sided tape.
5. Must be prised off carefully.
6. The door screen is now free.

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Remove four (4) screws holding the upper and lower oven hinge to the oven cavity. The lower oven hinge is now free.
3. Remove door assembly with upper oven hinge by pulling it forward.
4. Separate the door assembly and upper oven hinge. Door assembly is now free.
5. Re-install upper oven hinge to the new door assembly.
6. On re-installing new door assembly, secure the upper and lower oven hinges with the four (4) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.

7. CARRY OUT 4R CHECKS

Note: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

LATCH HEAD REMOVAL

1. Insert an iron plate(thickness of about 0.5mm)
2. Release the latch spring from the tabs of the door panel.
3. Release the latch spring from the latch head.
4. Release the latch head from the door panel.
5. Now, the latch head is free.

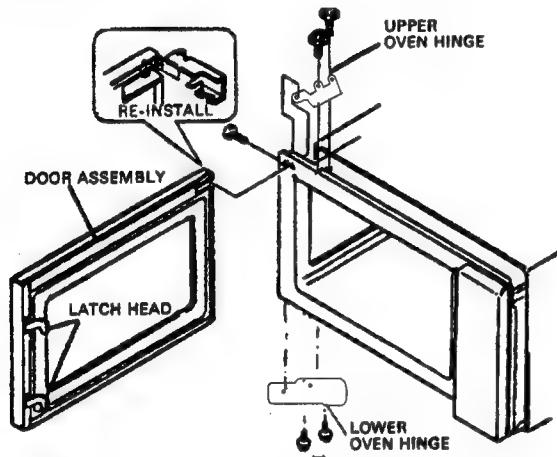


Figure C-6. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate(thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaged part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now choke cover is free.

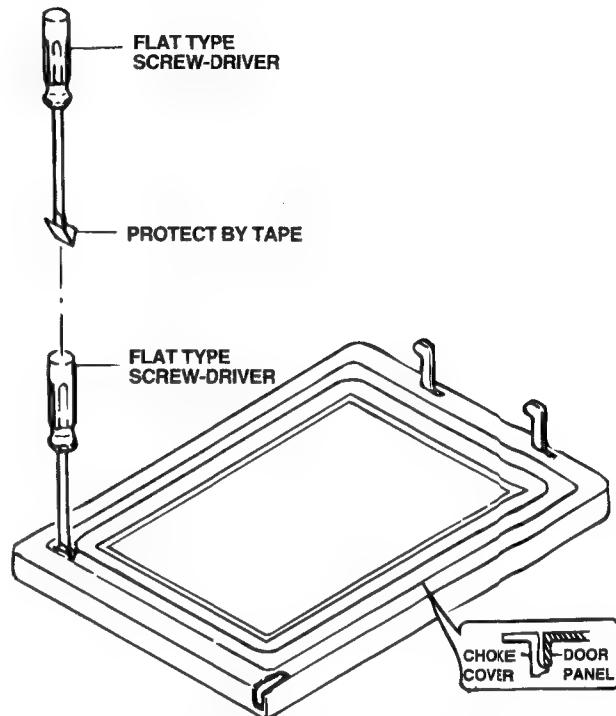


Figure C-7. Choke Cover Removal

DOOR FILM

Removal

1. Tear the door film from the door panel.
2. Now, the door film is free.

Installation

1. Put the adhesive tape on the backing film of the door film as shown in Fig. 8.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the door film on the door panel.

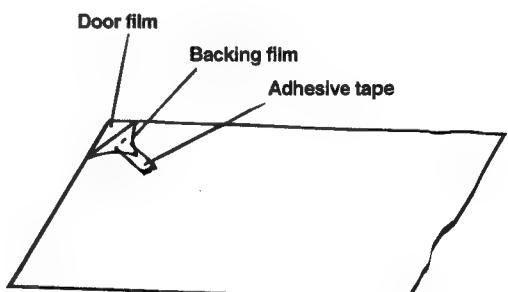


Figure C-8. Door film

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm² at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.

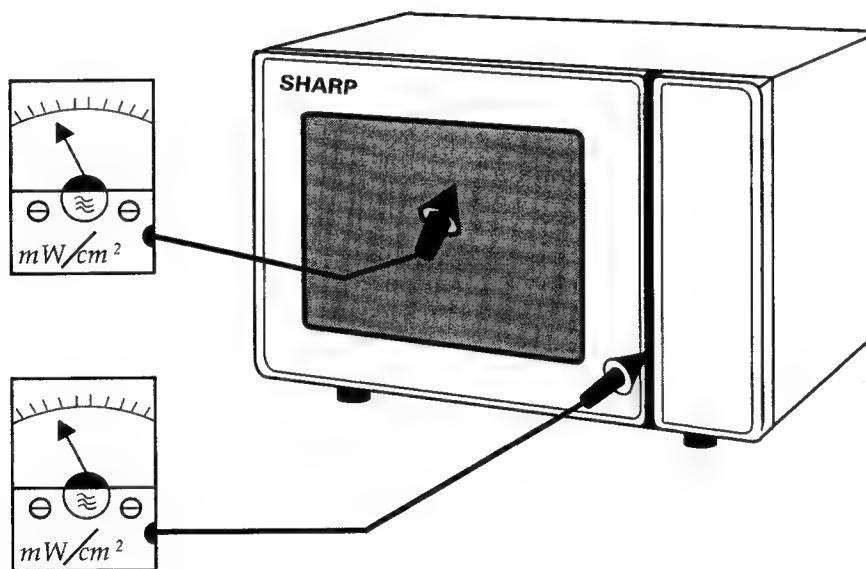
Important:

Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

NARDA 8100
NARDA 8200
HOLADAY HI 1500
SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the center of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

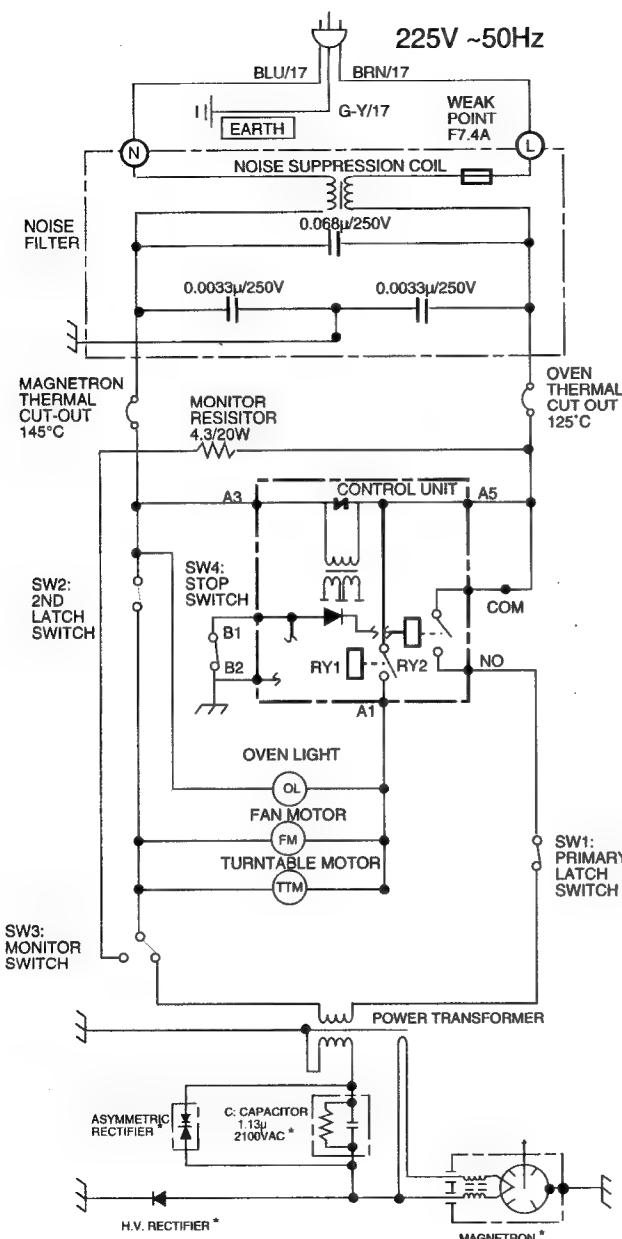
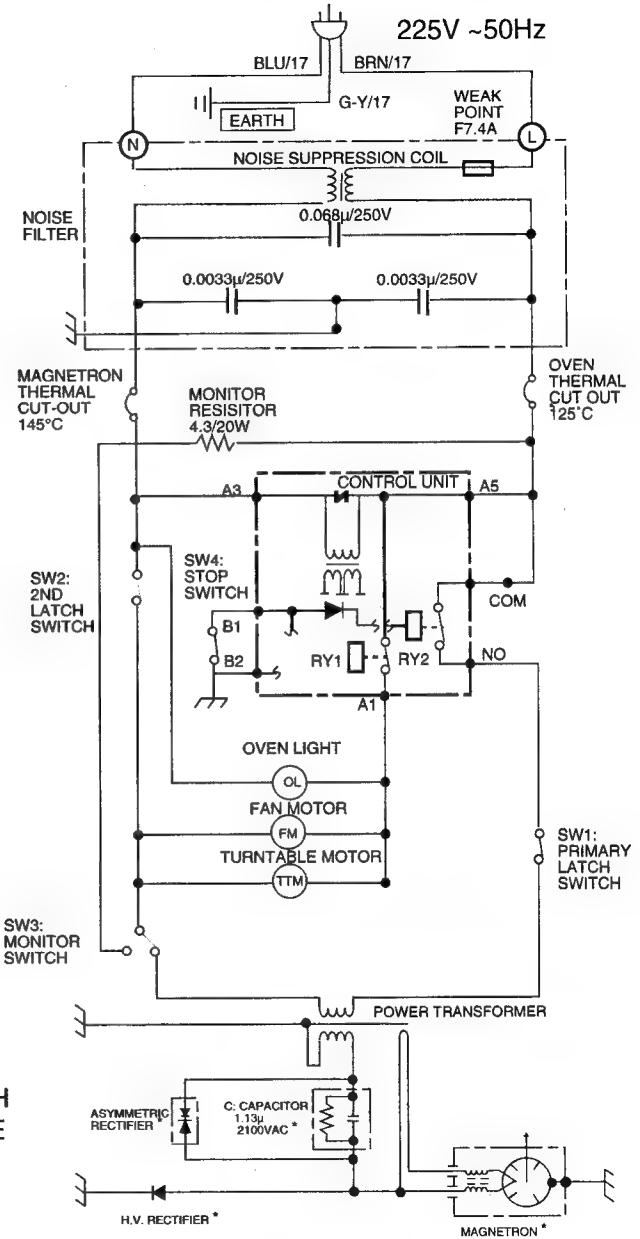
TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F	F7.4A 250V
Monitor resistor	R	4.3Ω 20W
Thermal cut-out (MG)	TC1	145°C
Thermal cut-out (OVEN)	TC2	125°C
Oven lamp	OL	230–240 V 25W E14
High voltage capacitor	C	1.13μF AC 2100V
Magnetron	MG	Filament < 1Ω Filament – chassis ∞ ohm.
Power transformer	T	Filament winding < 1Ω Secondary winding Approx. 93Ω Primary winding Approx. 1.4Ω

TEST POINT ON CONTROL UNIT

In/Out put terminal	Test Point	Volt	Resistance (Disconnect the power plug and close the door.)
Input terminal (Power supply)	A3–A5	240V	Approx. 966 ohm.
Input terminal (Stop switch)	B1–B2	–	0 ohm.
Output terminal (Oven lamp, Fan motor, Turntable motor)	A3–A1	240V	Approx. 95 ohm.
Output terminal (Power transformer)	A3–NO. of RY2	240V	Approx. 1.8 ohm.
Output terminal (Earth)	B2–Chassis	–	0 ohm.

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

Figure 0-2 Oven Schematic-OFF Condition Door Closed**Figure 0-1 Oven Schematic-ON Condition Door Closed**

NOTE: * COMPONENTS WITH POTENTIALS ABOVE 250V

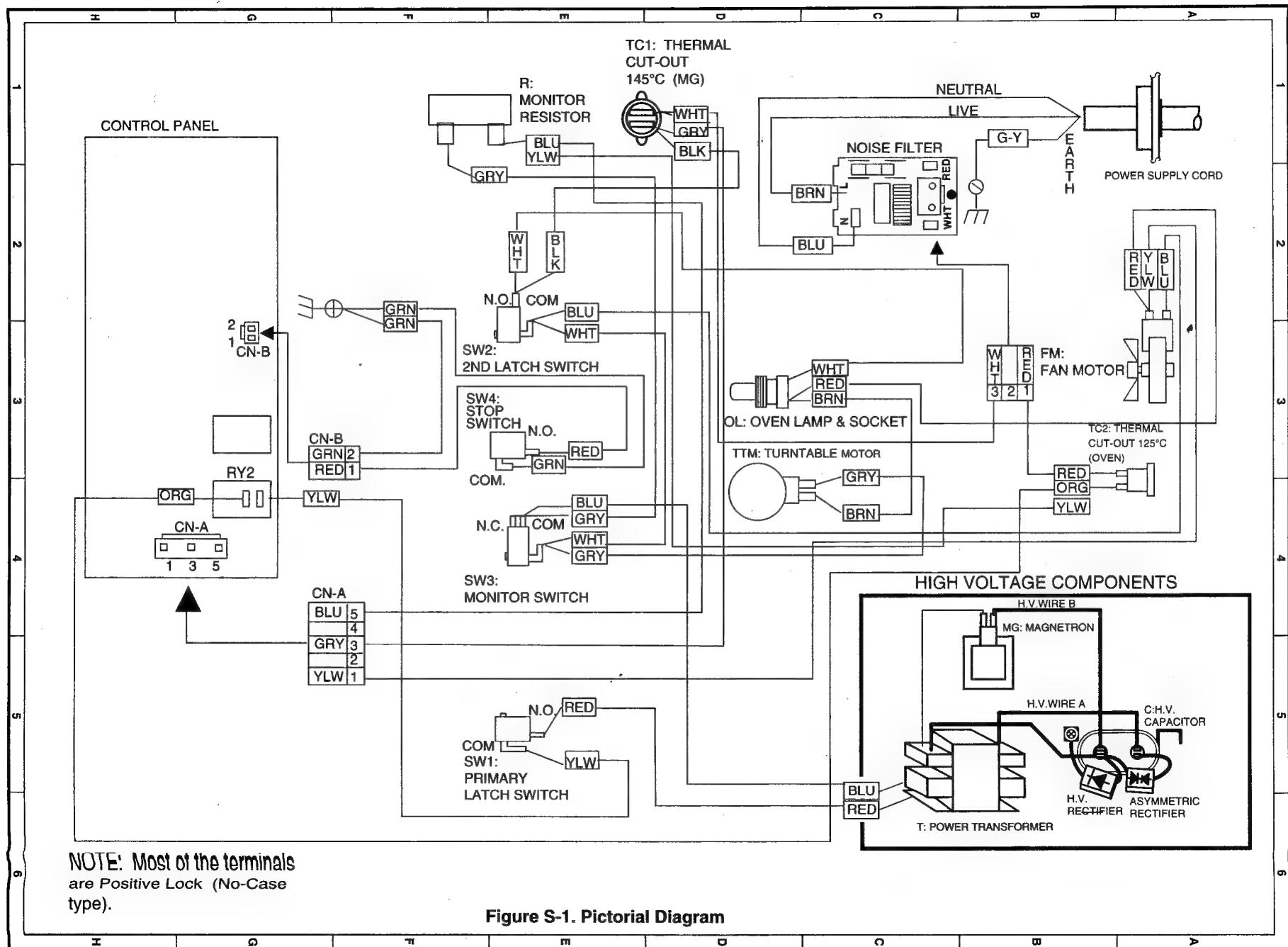
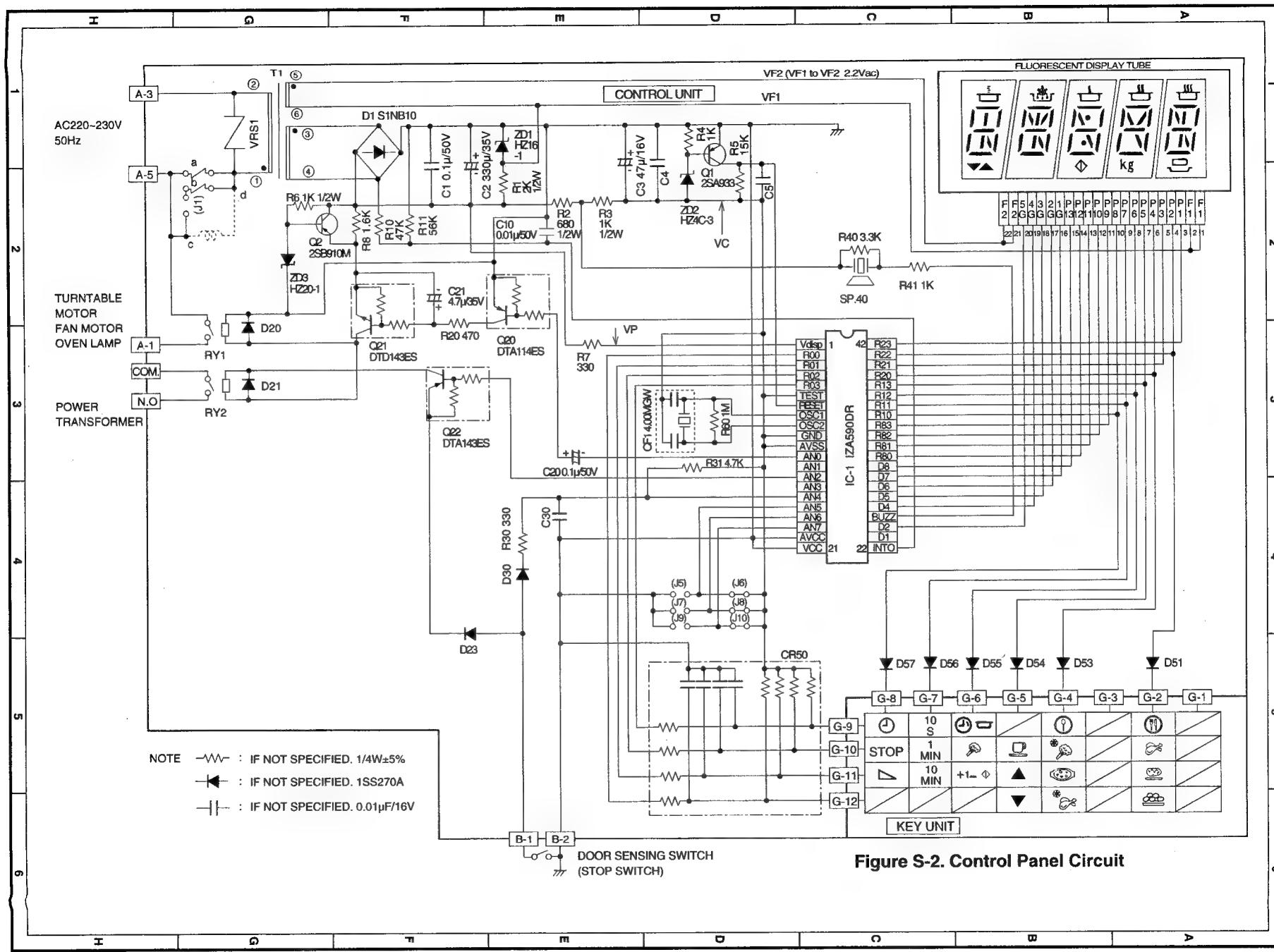


Figure S-1. Pictorial Diagram



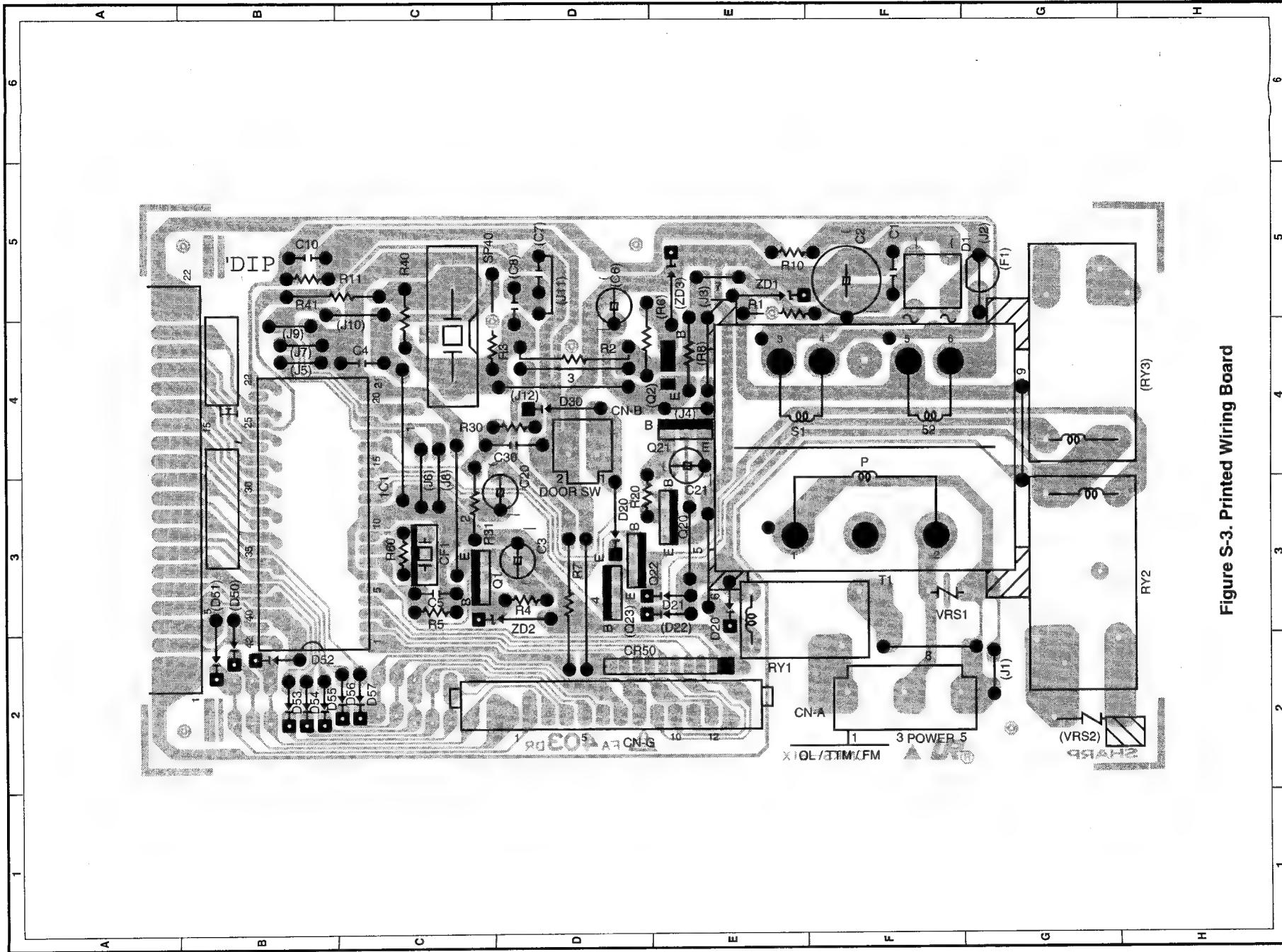


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked ** are used in voltage more than 250V.

"S" MARK: SPARE PARTS-DELIVERY SECTION

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
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ELECTRIC PARTS

*	1-1	FH-DZA033WRE0	U H.V. rectifier assembly	1	AP
	1-2	FPWBFA282WRE0	U Noise filter	1	AZ
	1-3	QACCVA063WRE0	U Power supply cord	1	AR
	1-4	QSW-MA110WRE0	J Stop switch	1	AK
	1-5	RV-MZA189WRE0	U Magnetron	1	BF
*	1-6	RC-QZA185WRE0	U High voltage capacitor	1	AX
	1-7	QSW-MA110WRE0	J Primary latch switch	1	AK
	1-8	QSW-MA110WRE0	J 2nd latch switch	1	AK
	1-9	QSW-MA111WRE0	J Monitor switch	1	AK
	1-10	RMOTEA308WRE0	U Fan motor	1	AU
	1-11	QFS-CA019WRE0	J Fuse F7.4A	1	AE
	1-12	RLMPTA067WRE0	U Oven lamp/socket	1	AK
	1-13	RMOTDA068WRE0	J Turntable motor	1	AQ
	1-14	RR-WZA020WRE0	J Monitor resistor 4.3 ohm 20W	1	AF
	1-15	RTHM-A080WRE0	U Thermal cut-out 145°C (Magnetron)	1	AL
	1-16	RTHM-A078WRE0	U Thermal cut-out 125°C (Oven)	1	AL
*	1-17	RTRN-A424WRE0	U Power transformer	1	BN

CABINET PARTS

2-1	GCABUA461WRT0	U Outer case cabinet (B)	1	AW
2-1	GCABUA471WRT0	U Outer case cabinet (W)	1	AW
2-2	GLEGPA057WRE0	U Foot	4	AB
2-3	FHNG-A208WRY0	U Lower oven hinge assy	1	AD

CONTROL PANEL PARTS

3- 1	CPWBFA588WRK0	J Control unit	1	BV
3- 1A	QCNCMA234DRE0	J 3-pin connector (A)	1	AC
3- 1B	QCNCMA275DRE0	J 2-pin connector (B)	1	AB
3- 1C	QCNCWA030DRE0	J 12-pin connector (G)	1	AE
3- 1D	RV-KXA057DRE0	J Fluorescent display tube	1	AK
3- 1E	PCUSGA381WRP0	J Cushion	1	AG
3- 1F	PTUB-A003DRE0	J Tube	1	AG
C1	RC-KZA087DRE0	J Capacitor 0.1 uF 50V	1	AB
C2	VCEAB31VW337M	J Capacitor 330 uF 35V	1	AC
C3	VCEAB31CW476M	J Capacitor 47 uF 16V	1	AB
C4-5	VCKYD11CY103N	J Capacitor 0.01 uF 16V	2	AH
C10	VCTYF31HF103Z	J Capacitor 0.01 uF 50V	1	AB
C20	VCEAB31HW104M	J Capacitor 0.1 uF 50V	1	AT
C21	VCEAB31VW475M	J Capacitor 4.7 uF 35V	1	AA
C30	VCKYD11CY103N	J Capacitor 0.01 uF 16V	1	AH
CF1	RCRS-A012DRE0	J Ceramic resonator (CST4.00MGW)	1	AD
CR50	RMPTEA011DRE0	J CR array	1	AL
D1	RSRCDAB013DRE0	J Diode bridge (S1NB10)	1	AG
D20-21	VHD1SS270A/-1	J Diode (ISS270A)	2	AA
D23	VHD1SS270A/-1	J Diode (ISS270A)	1	AA
D30	VHD1SS270A/-1	J Diode (ISS270A)	1	AA
D51	VHD1SS270A/-1	J Diode (ISS270A)	1	AA
D53-57	VHD1SS270A/-1	J Diode (ISS270A)	5	AA
IC1	RH-IZA590DRE0	J LSI	1	AT
Q1	VS2SA933S// -3	J Transistor (2SA933S)	1	AB
Q2	VS2SB910MR/-4	J Transistor (2SB910M)	1	AE
Q20	VSDTA114ES/-3	J Transistor (DTA114ES)	1	AB
Q21	VSDTD143ES/-3	J Transistor (DTD143ES)	1	AC
Q22	VSDTA143ES/1B	J Transistor (DTA143ES)	1	AB
R1	VRD-B12HF202J	J Resistor 2k ohm 1/2W	1	AB

Note: The parts marked *** are used in voltage more than 250V.

"\$" MARK: SPARE PARTS-DELIVERY SECTION

REF. NO.	PART NO.	\$	DESCRIPTION	Q'TY	CODE
R2	VRD-B12HF681J	J	Resistor 680 ohm 1/2W	1	AA
R3	VRD-B12HF102J	J	Resistor 1k ohm 1/2W	1	AA
R4	VRD-B12EF102J	J	Resistor 1k ohm 1/4W	1	AA
R5	VRD-B12EF153J	J	Resistor 15k ohm 1/4W	1	AA
R6	VRD-B12HF102J	J	Resistor 1k ohm 1/2W	1	AA
R7	VRD-B12EF331J	J	Resistor 330 ohm 1/4W	1	AA
R8	VRD-B12EF162J	J	Resistor 1.6k ohm 1/4W	1	AB
R10	VRD-B12EF473J	J	Resistor 47k ohm 1/4W	1	AA
R11	VRD-B12EF563J	J	Resistor 56k ohm 1/4W	1	AA
R20	VRD-B12EF471J	J	Resistor 470 ohm 1/4W	1	AA
R30	VRD-B12EF331J	J	Resistor 330 ohm 1/4W	1	AA
R31	VRD-B12EF472J	J	Resistor 4.7k ohm 1/4W	1	AA
R40	VRD-B12EF332J	J	Resistor 3.3k ohm 1/4W	1	AA
R41	VRD-B12EF102J	J	Resistor 1k ohm 1/4W	1	AA
R60	VRD-B12EF105J	J	Resistor 1M ohm 1/4W	1	AA
RY1	RRLY-A078DRE0	J	Relay (OJ-SH-118LM)	1	AG
RY2	RRLY-A092DRE0	J	Relay (VRB18SP)	1	AL
SP40	RALM-A014DRE0	J	Buzzer (PKM22EPT-CA)	1	AG
T1	RTRNPA082DRE0	J	Transformer	1	AX
VRS1	RH-VZA032DRE0	J	Varistor (10G471K)	1	AH
ZD1	VHEHZ161///-1	J	Zener diode (HZ16-1)	1	AA
ZD2	VHEHZ4C3///-1	J	Zener diode (HZ4C-3)	1	AA
ZD3	VHEHZ201///-1	J	Zener diode (HZ20-1)	1	AA
3- 2	DUNTKA616WRK0	J	Key unit assembly [R-3A56(B)]	1	AZ
3- 2	DUNTKA615WRK0	J	Key unit assembly [R-3A56(W)]	1	AZ
3- 2-1	FUNKA602WRE0	J	Key unit [R-3A56(B)]	1	AY
3- 2-1	FUNKA601WRE0	J	Key unit [R-3A56(W)]	1	AY
3- 3	GMADIA075WRFO	U	Display window	1	AD
3- 4	HPNLCB137WRFO	U	Control panel frame [R-3A56(B)]	1	AK
3- 4	HPNLCB138WRFO	U	Control panel frame [R-3A56(W)]	1	AK
3- 5	JBTN-A889WRFO	U	Open button [R-3A56(B)]	1	AC
3- 5	JBTN-A890WRFO	U	Open button [R-3A56(W)]	1	AC
3- 6	MSPRCA045WRE0	U	Open button spring	1	AA
3- 7	KEPSD30P10XS0	J	Screw; Control unit mtg.	2	AA

OVEN PARTS

4-1	DOVN-A394WRT0	U	Oven cavity	1	BF
4-2	LBNDKA096WRP0	U	Capacitor holder	1	AE
4-3	PHOK-A092WRF0	U	Latch hook	1	AH
4-4	NFANJA035WRE0	U	Fan blade assembly	1	AK
4-5	PDUC-A574WRF2	U	Fan duct	1	AW
4-6	LANGFA169WRP0	U	Chassis support	1	AE
4-7	PPACGA126WRE0	U	Packing	1	AC
4-8	MHNG-A346WRP0	U	Upper oven hinge	1	AD
4-9	MLEVFA078WRFO	U	Open lever	1	AE
4-10	PCOVPA281WRE0	U	Waveguide cover	1	AE
4-11	PDUC-A578WRF0	U	Air intake duct	1	AE
4-12	PCUSGA360WRP0	U	H.V cushion	2	AA
4-13	PCUSUA394WRP0	U	Cushion	1	AB
4-14	PCUSUA395WRP0	U	Cushion	1	AB
4-15	GDAI-A251WRP0	U	Base plate	1	AN
4-16	PCUSGA308WRP0	U	Absorb cusion	1	AB

DOOR PARTS

5	CDORFA643WRK0	U	Door assembly (B)	1	BE
5	CDORFA642WRK0	U	Door assembly (W)	1	BE
5-1	FDORFA273WRT0	J	Door panel assembly	1	AX
5-2	GCOVHA335WRF0	U	Choke cover	1	AF
5-3	GWAKPA298WRF1	U	Door frame (B)	1	AP
5-3	GWAKPA299WRF1	U	Door frame (W)	1	AP
5-4	HPNL-A554WRR0	U	Door screen (B)	1	AU
5-4	HPNL-A555WRR0	U	Door screen (W)	1	AU
5-5	LSTPPA126WRF1	U	Latch head	1	AD
5-6	MSPRTA141WRE0	U	Latch spring	1	AA
5-7	PSHEPA458WRE1	U	Door film	1	AE
5-8	XCPSD30P06000	J	Screw; 3mm x 6mm	1	AA

Note : The parts marked ** are used in voltage more than 250V.

"S" MARK: SPARE PARTS-DELIVERY SECTION

MISCELLANEOUS

6-1	FROLPA070WRK0	U	Roller stay	1	AN
6-2	NTNT-A060WRE0	U	Turntable	1	AN
6-3	TINS-A449WRR0	U	Operation manual	1	AH
* 6-4	QW-QZA191WRE0	U	H.V. wire A	1	AF
* 6-5	QW-QZA192WRE0	U	H.V. wire B	1	AF
6-6	FW-VZB333WRE0	U	Main wire harness	1	AT
6-7	TCAUHA092WRR1	U	Caution label	1	AD
6-8	TSPCNC017WRR0	U	Rating label	1	AC
6-9	FW-VZB270WRE0	U	Stop switch harness	1	AF
6-10	TLABMA419WRR0	U	Menu label	1	AA
6-11	TCADCA541WRR0	U	Cookery book	1	AM

SCREW, NUT AND WASHER

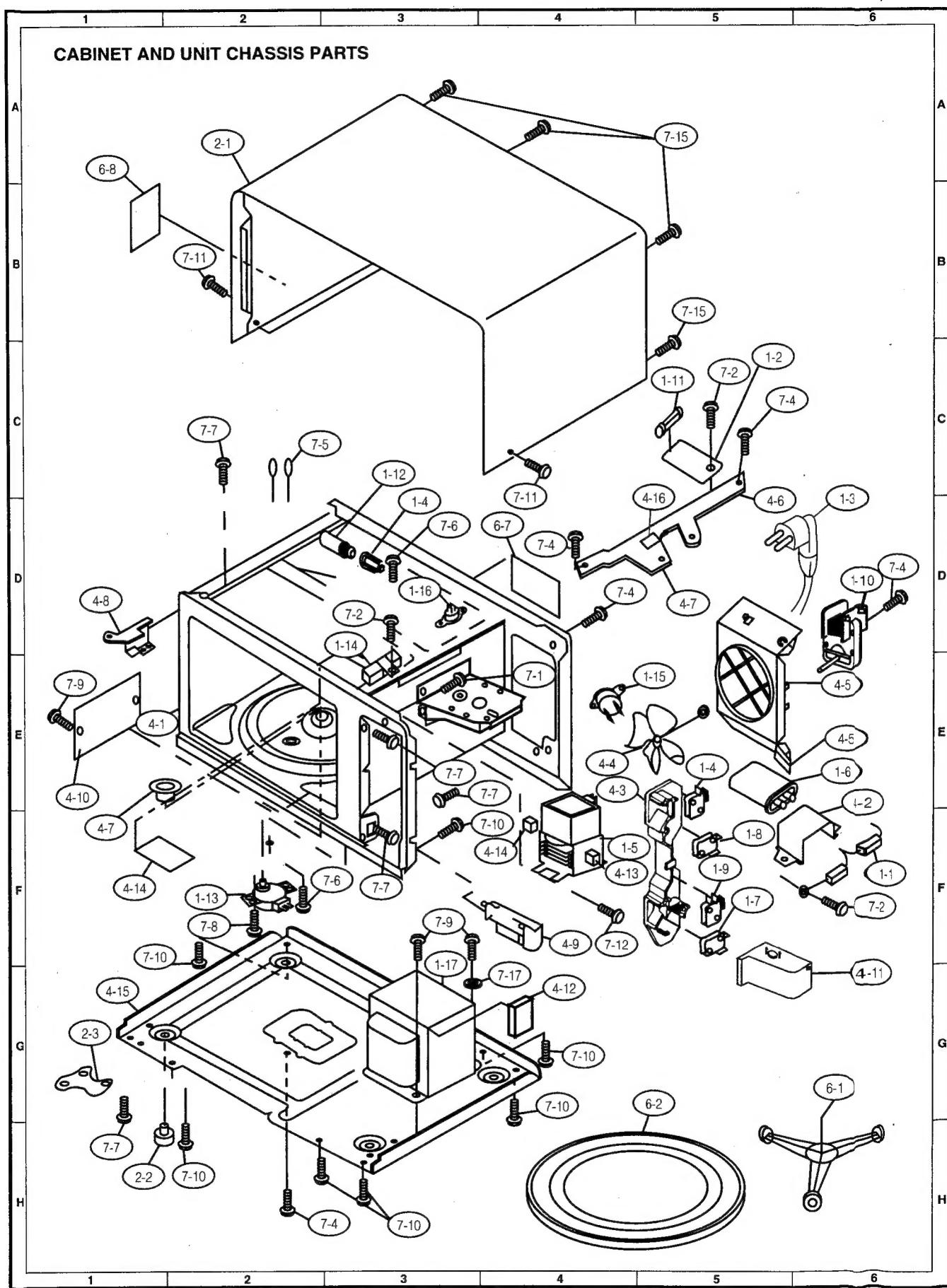
7-1	XOTSD40P10000	J	Screw 4mm x 10mm	2	AA
7-2	XHTSD40P08RV0	J	Screw 4mm x 8mm	3	AA
7-3	XHSSF40P08000	J	Screw 4mm x 8mm (B)	1	AA
7-3	XHSSC40P08000	J	Screw 4mm x 8mm (W)	1	AA
7-4	LX-EZA045WRE0	U	Special screw	8	AA
7-5	LX-LZA011WRE0	U	Rivet	2	AB
7-6	XBUW40P06000	J	Screw 4mm x 6mm	1	AA
7-7	XCPSD30P06000	J	Screw 3mm x 6mm	4	AA
7-8	XFPSD40P08000	J	Screw 4mm x 8mm	3	AA
7-9	PCLICA030WRE0	J	P clip	1	AA
7-10	XOTSD40P12RV0	J	Screw 4mm x 12mm	18	AA
7-11	XOTSD40P12000	J	Screw 4mm x 12mm (B)	4	AA
7-11	XOTSC40P12000	J	Screw 4mm x 12mm (W)	4	AA
7-12	XWWSD50-06000	J	Washer	1	AA
7-14	XCPS030P04000	J	Screw 3mm x 4mm	1	AA

HOW TO ORDER REPLACEMENT PARTS

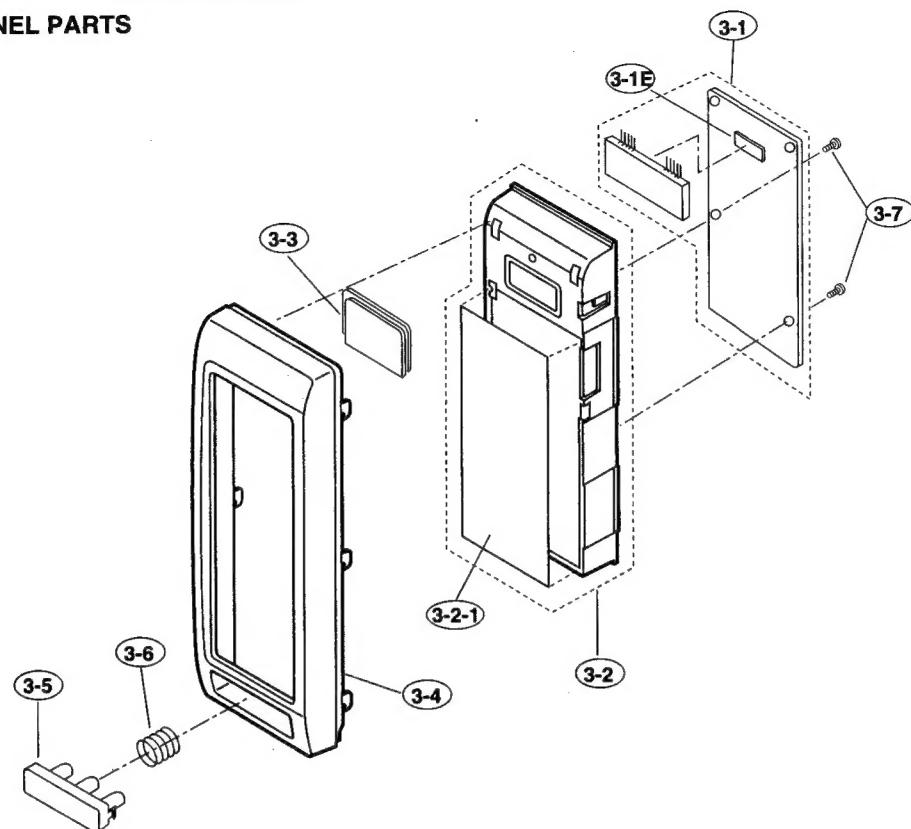
To have your order filled promptly and correctly, please furnish the following information.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |

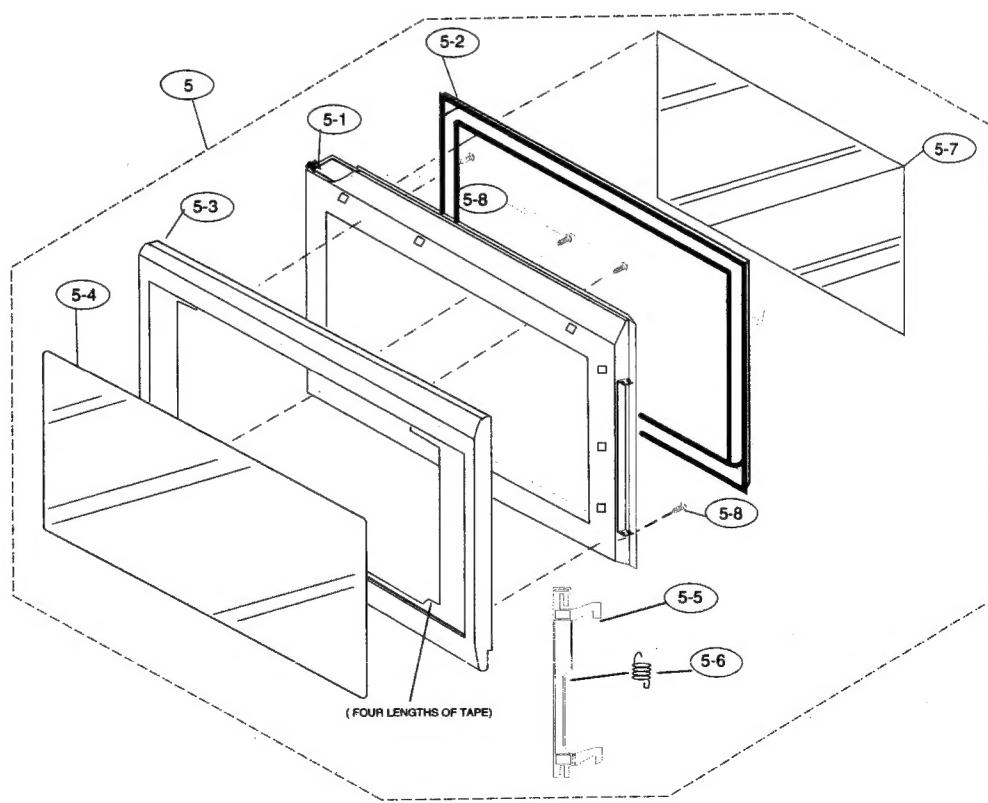
CABINET AND UNIT CHASSIS PARTS

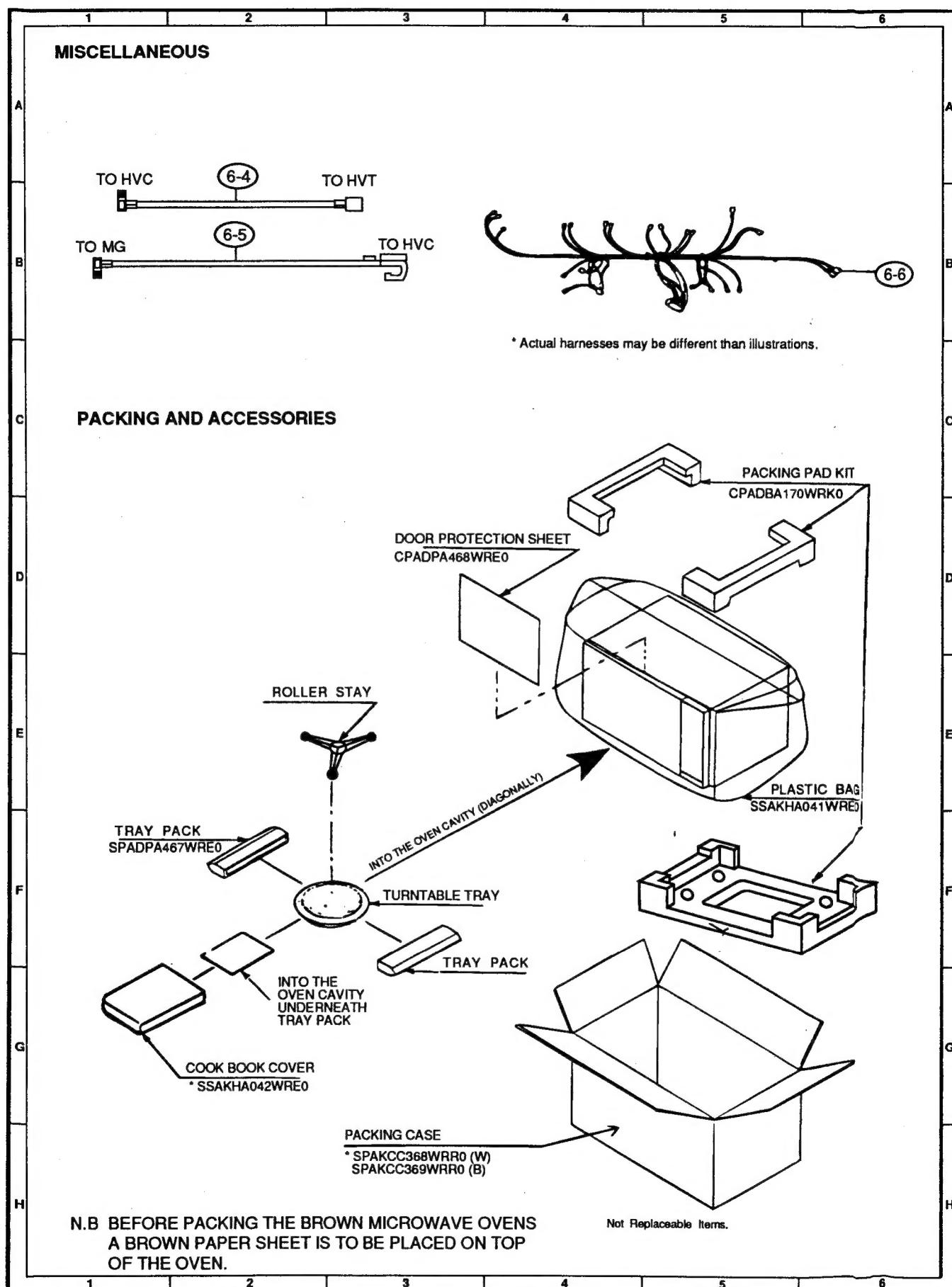


CONTROL PANEL PARTS



DOOR PARTS





R-3A56(W)
R-3A56(B)

SHARP®